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53. ES in Agricultural Ecosystems to enhance ecosystem services : specificities in concepts, measurement methods and promotion tools (OPEN) & 54. Managing Biodiversity and ES in Agricultural Habitats (OPEN)

Coffee berry borer *Hypothenemus hampei* (Coleoptera: Curculionidae: Scolytinae) removal in coffee plantations: a pest control service provided by birds

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Coffee is one of the most important crops in tropical regions of the world, where areas suited for its production are usually immersed within important biodiversity conservation regions. Studies in these agricultural systems have proven its conservation value, particularly for bird species which provide us with an array of ecosystem services including seed dispersal, pollination, and pest control. Regulating ecosystem services such as pest control (MEA 2005) are especially important to quantify because their benefits can be perceived at smaller scales and directly by coffee growers. Positive effects of bird species in the removal of insects in coffee systems have already been established however fewer studies have focused specifically on the effect of bird species in the control of the coffee berry borer (cbb), one of the most damaging pests affecting coffee production worldwide. In order to assess this effect on January 2013 we set up an exclosure experiment in a Costa Rican coffee plantation where we randomly selected two coffee shrubs at ten different coffee plots, one of the coffee shrubs was then isolated from bird foraging activity by a plastic mesh preventing the entrance of birds but allowing insects to fly in and out. Brocap traps were installed at each one of the ten coffee plots to monitored cbb flights/availability, bird community was evaluated via point counts and mistnetting and direct evidence of predation was obtained through the identification of cbb DNA in fecal and emesis samples. Results show that 25% out of 117 bird species detected within our sampling units are exclusively insectivorous birds while 55% include invertebrates as part of their diet. Trapping of cbb indicated several episodes of flights/availability of the pest throughout the year. Coffee berry borer infestation rates were significantly higher in coffee shrubs excluded in comparison with coffee shrubs exposed to bird foraging activity ($F=23.40$, $p=0.0019$). Preliminary DNA analysis shows evidence of insectivorous bird species predating on the genus *Hypothenemus*. Our findings provide further evidence on the potential contribution of insectivorous bird species in the removal and control of the coffee berry borer in coffee systems and highlight the importance of further studies using molecular biology techniques that allow to quantify the amount of cbb consumed by birds on a given moment as well as the economic importance of this service.